Chapter 7. Management Methods

Management methods refer to the products or processes that help agencies, partners and stakeholders agree on key watershed planning decisions. Management methods are described in this chapter, and User's Guide Tool 22 provides additional information on each. The management methods are:

A. Finalize Watershed Goals, Objectives, and Indicators
B. Identify Priority Subwatersheds
C. Compile an Inventory of Potential Projects
D. Draft the Watershed Plan
E. Adopt the Final Plan

A. Finalize Watershed Goals, Objectives and Indicators

The purpose of this method is to finalize clear and measurable goals and objectives to guide the watershed planning process, as well as the indicators that will be used to measure progress. Initial watershed goals were developed prior to beginning the watershed planning process, based on the pollutants of concern (Chapter 3), and these goals were developed further, along with specific objectives and indicators through the stakeholder process (Chapter 6). In this step, the goals, objectives and indicators identified earlier are finalized to ensure that they align with goals of all applicable watershed planning drivers, and to decide whether they should be formally adopted.

Local watershed goals and objectives should always be aligned with the goals from other environmental and planning initiatives and regulatory drivers. The core team should review the following documents to ensure their goals are consistent:

- Chesapeake 2000 Agreement
- Coastal Bays Comprehensive Conservation Management Plan*
- Local comprehensive plans
- Local flood management plans
- Local water and sewer facilities plans
- Maryland Clean Water Action Plan
- Maryland Wetland Conservation Plan

- NPDES Phase I watershed restoration plans*
- Scenic and Wild River resource management plans*
- Source Water Assessment plans*
- TMDL plans*
- Tributary Strategies

* may not apply to all communities

The final product of this step is a watershed agreement, memorandum of understanding, interagency directive, or consensus statement that is used to clearly articulate and formalize the goals of the watershed plan. This agreement can be executed by elected officials, key stakeholders and/or senior agency leaders, and may be extremely useful in elevating the profile of watershed planning and ensuring greater interagency coordination in subsequent steps. This language can be submitted to agency heads, elected officials or boards of directors for formal adoption.

One way to ensure that watershed goals are met is by incorporating the watershed plan into the comprehensive plan. This can help promote interagency cooperation and consistency, and make implementation a higher priority. Comprehensive plans must be updated every six years, and incorporating watershed plan recommendations at that time can save effort or money. For example, comprehensive plans require a Sensitive Areas element. Many watershed recommendations can be directly incorporated into comprehensive plan sections that address protection of steep slopes, streams, and other sensitive areas.

B. Identify Priority Subwatersheds

The product of this management method is simple: an agreement on which subwatersheds to work on first. Subwatersheds are ranked by the core team (see Chapter 4), primarily based on subwatershed metrics that are a synthesis of mapping and field data, and input from stakeholders. A number of top-ranked subwatersheds are then identified as priorities for further assessment and planning. A short report is prepared that supports the choice of priority subwatersheds, documents assumptions used in the ranking process, and depicts their locations on a simple watershed map. The report should be fewer than 10 pages long, and include longer appendices that detail ranking methods, subwatershed data and stakeholder input.

The draft list of priority subwatersheds is then circulated to local agencies and other stakeholders for review and comment. Further meetings or open forums may be necessary if stakeholders cannot agree on the basis for the ranking. If desired, a long-range plan can be identified for assessing all subwatersheds in the community. This may be particularly important if stakeholders are concerned that watershed planning efforts are being deferred in lower priority subwatersheds.

C. Compile an Inventory of Potential Projects

The management product for this step is an inventory of all feasible projects and land use changes that could be used to protect or restore the watershed to meet the overall goals and objectives. To create this inventory, projects are compiled into a master binder or into the watershed-based GIS. Before assembling the inventory, draft project concept designs should be checked for accuracy and thoroughness, and unique ID numbers should be assigned to each project if this has not already been done. Handwritten entries may need to be neatened and sketches redrawn. The team should also check to see that all field forms, digital photos, sketches, field notes, and other project data are organized into a single project folder. Individual project concept designs are then finalized in the form of a two to four page project summary that includes the feasibility assessment, sketch, narrative and initial cost estimate.

Individual recommendation summaries are then assembled into a master binder that is divided into sections according to the type of project. A table is then created for each section that summarizes the projects by ID number, cost, area treated, and basic description. The table also serves as an index for the section with, individual projects listed in descending order based on size or treatment area, which should always be shown in units consistent with the Chesapeake Bay Model. When completed, the master binder serves as the watershed project archive.

The front-end of the inventory should contain a subwatershed project locator map and a summary matrix that compares the various projects. At this point, the inventory sufficiently organizes the project data to permit project ranking needed for the watershed plan. Figure 7.1 illustrates a map of all restoration projects identified in the Paxton Creek North Subwatershed near Harrisburg, PA.
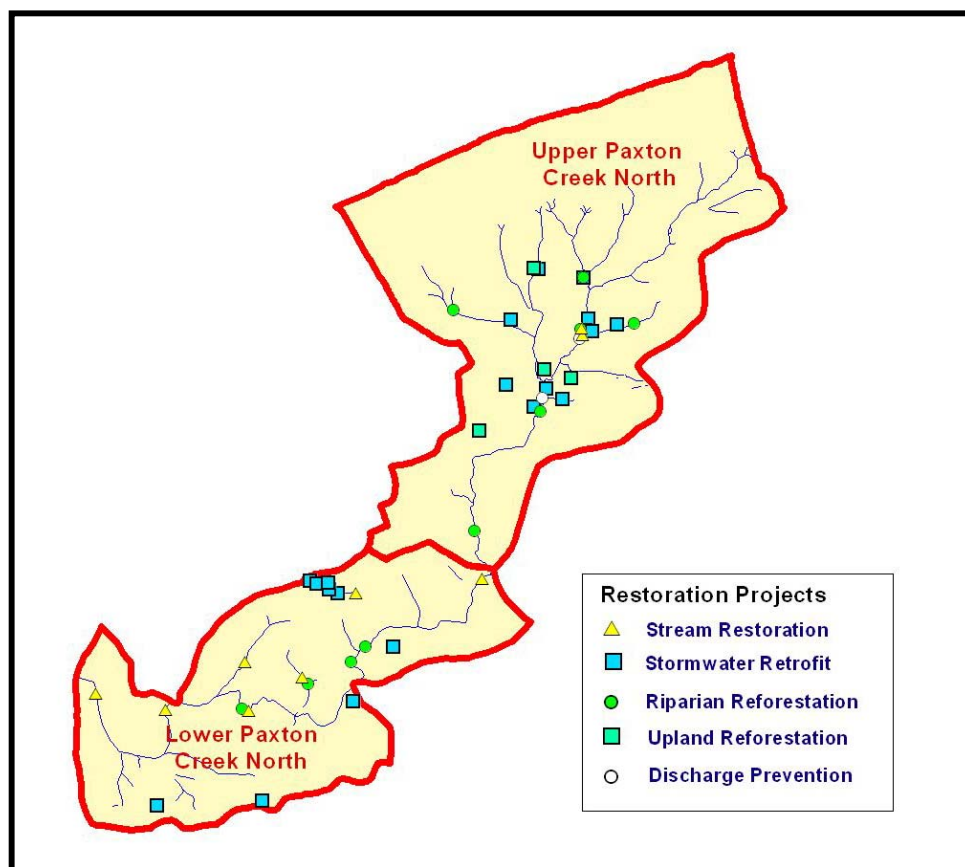
Figure 7.1: Restoration projects in the Paxton Creek North subwatershed, Pennsylvania

D. Draft the Watershed Plan

The product of this management method is a short and concise watershed plan that recommends specific projects and programs to be implemented, along with a watershed management map. Good watershed plans do not need to be long or complex. Instead, they should be written with the punch of a newspaper article, and clearly specify the "what," "why," "when," "where," "how much," and "by whom" of the recommended projects. The core team should brainstorm at this stage to define the specific objectives that the plan is expected to accomplish. The team should try to define objectives that are clear, time-based and measurable. The main body of a good watershed plan should be no more than 20 to 40 pages long, with a table of key recommendations and a watershed map showing specific project locations. The

extensive supporting data produced in earlier steps should be consigned to technical appendices, preferably in a second volume. The core team should draft and carefully review the plan outline to make sure it only contains the most essential information needed to make good decisions.

The most important part of the watershed plan is the recommendations. Some examples of potential projects and recommendations are described below and illustrated in Table 7.1.

- <u>Priority protection and restoration projects</u> include the top-ranked protection projects, which may include land conservation projects, and restoration projects identified through project investigations, which include stream restoration, stormwater retrofits, and riparian reforestation

- <u>Regulatory and programmatic recommendations</u> include recommended changes to local codes, ordinances and programs that are derived from the audit of local government capacity to protect the watershed, examples include adopting a stream buffer ordinance, encouraging open space design, and establishing watershed education program.

- <u>Land use changes and management approaches</u> include changes needed to comprehensive plans and subsequently the zoning regulations to align with watershed and subwatershed goals, examples include a transfer of development rights (TDR) program that would transfer development density to a more suitable area.

Table 7.1: Example Recommendations Included in a Watershed Plan	
Protection/Restoration Projects	*Regulatory/Programmatic Recommendations*
• Conduct shoreline restoration using living shoreline techniques along Battle Creek to provide protection of an archaeological site and reduce erosion • Retrofit at the unmanaged stormwater outfall located in the Cavalier Country subdivision with an infiltration basin • Conduct stream clean-ups in Middle and Lower Bynum • Preserve the contiguous forest located in the Lower Winters Run and Cranberry Run subwatersheds	• Hire a watershed coordinator who can work with watershed groups to implement recommendations, secure funding, and track progress of project implementation. • Establish river and stream crossing standards to avoid impact and disruption of fish passage • Implement an onsite sewage disposal system management strategy that will include a requirement for septic system inspection at time of sale and tax incentives for homeowners to upgrade • Develop a heightened stormwater plan review for Special Resource Subwatersheds

The recommendations should include an implementation planning table with detailed information on each recommendation that includes the objective, responsible party, measurable indicator, public involvement, programmatic change, estimated cost, potential funding sources, and an implementation timeframe. Table 7.2 provides an example of such a table. At this stage the core team should also consider future partnerships and availability of funding sources such as capital improvement program (CIP) expenditures. The linkages between certain projects are important to maintain and note as well. The success of one project may be dependant on the implementation of another (e.g., stream repair and upstream stormwater retrofit).

The watershed plan should include both short-term (commitments that can be completed within the first year of the plan) and long-term (commitments that will be implemented over the next five to seven years) recommendations, which allows the core team to estimate the annual implementation budget over five to seven years. Make sure the elements needed for restoration projects are specifically identified in the project concept design and project ranking stages.

The core team may also want to consider breaking the full compilation of recommendations into three prioritization tiers with the first tier representing the top watershed recommendations. Tier 2 and 3 recommendations should still be pursued, but monetary and staff resources should initially be directed towards Tier 1 recommendations. There is no exact methodology for prioritization as it will vary from watershed to watershed. However the core team may want to base the prioritization on the following factors:

- Does the recommendation affect a priority subwatershed?
- What is the overall benefit to watershed health?
- Does the recommendation directly meet watershed goals?
- Does the recommendation require more assess or program development?
- Is there strong stakeholder interest or support in the recommendation?
- Is there a time sensitivity element associated with the recommendation (e.g., conservation of a contiguous forest tract that is under development pressure)?

Table 7.2 Example of an Implementation Planning Table (modified from the Upper Monocacy WRAS)						
Objective/Recommendation	*Responsible Party*	*Schedule*	*Measurable Indicators*	*Public Involvement*	*Additional Benefit*	*Cost Estimate and Funding Sources*
#1: Fence livestock herds out of streams in Glade and Fishing Creek subwatersheds	Agricultural Practices Working Group, landowners, SCD*	3 properties each year	25,315 linear ft in pasture; increase in IBI score	Outreach to farmers whose livestock have stream access	Improved herd health	cattle fencing: ~2.60/linear foot; CBT or NFWF grant
#30: Teach homeowners six "greener" lifestyle practices; increase participation by 5%/ year	Citizen Practices Working Group	Ongoing	Number of those attending workshops	Outreach to homeowners	Rain barrels retrofitted by developmentally disabled	$15,000/yr
*SCD: Soil Conservation District						

The last step in plan writing involves assembling the appendices that provide the technical support to the overall plan. As noted earlier, it may be preferable to include these in a second volume, since fewer stakeholders are interested in the technical details of the plans. Table 7.3 recommends a table of contents for a watershed plan that organizes information in a relatively condensed format.

Table 7.3: Typical Table of Contents for a Watershed Plan
Executive Summary • List of priority projects – both a table and a map of project locations • Programmatic/regulatory recommendations • Implementation schedule and costs
Introduction • Background discussion on the watershed and its natural/historical/environmental resources • Layout of the document
Management Practices/Projects • Brief introduction to methods and assessments conducted with a few examples of the types of projects recommended by each assessment
Watershed-wide Goals and Recommendations • These include regulatory and programmatic recommendations as well as additional staffing needs, etc.
Subwatershed Management Strategies* • Review of subwatershed objectives • Table and brief discussion of subwatershed characteristics (area, land uses, current and future IC) • Review of existing conditions (brief discussion of stream and upland surveys) and problems found during field work • Recommendations (with a paragraph and picture discussing each one and a table summarizing costs, responsible party, implementation schedule)
Appendices - potential appendices include: • Summary table and map of all potential projects • Memos outlining WTM or modeling results and methods for ranking projects • Summary of stakeholder meetings organized by subwatershed • Baseline report
* If the watershed is less than 100 square miles and consists of approximately 10 subwatersheds, each one should have its own chapter. If, however, there is a significantly higher number, it may be worth grouping similar subwatersheds together into chapters based on management classification.

E. Adopt the Final Plan

The purpose of this management method is to put together a strategy to get the watershed plan adopted, funded, and implemented over time. This requires a keen grasp of the local political landscape, partnership structure, and budgetary process. The core team should think through how it will navigate the plan through the political and bureaucratic system. The strategy will be unique in every community, but often involves identifying funding strategies and a timeframe for implementation, establishing a partnership structure for getting the plan implemented,

deciding on commitments for short-term protection and restoration projects, establishing capital and operating budget needs, and scheduling the briefings needed for plan adoption.

There is no universal method to adopt the final plan since the local political process, partnership structure, and budgetary system are different in every community. Elected officials are obviously the most important stakeholder group, but they often want to know if local agencies, regulators, local media, and other constituent groups support its adoption. Some potential options for getting the plan adopted include:

- *Community incorporates the watershed plan as part of the comprehensive plan* - comprehensive plans require a Sensitive Areas element, and many of the recommendations from the watershed plan can be incorporated into this section. The Real World Example on the next page provides an example of a county that incorporated certain watershed plan recommendations into its comprehensive plan.

- *Elected officials endorse the entire plan* – the best outcome would be that local elected officials would endorse the watershed plan in its entirety.

- *Elected officials endorse the goals of the plan* – watershed goals are best formalized through a watershed agreement, memorandum of understanding, interagency directive or consensus statement that clearly articulates the goals and the local commitment to achieve them. Assuming consensus is reached, final language is then submitted to agency heads, elected officials or board of directors for formal adoption.

- *Local government commits to funding implementation of the plan* – by agreeing to fund implementation, the local government is endorsing the recommendations of the watershed plan. This may be a more feasible option for the local government, depending on the political atmosphere.

The core team may want to consider the following factors carefully before introducing the plan into the political process.

The political landscape and budgetary situation is different in every community, but it is surprising how many local watershed plans are developed with little regard to either important factor. Quite simply, a good plan submitted at a bad time may not be adopted. At this stage, the core team should make sure they know which way the political and budgetary winds blow, by getting good answers to the following questions:

- When is the next election cycle in the community?
- Should critical decisions for political bodies be deferred into non-election years?
- How tight are local budgets expected to be in the next few years?
- How favorably disposed are elected officials to watershed planning issues?
- Is more education needed to get them up to speed?
- What key issues will motivate them to support watershed planning (community support, environmental concern, regulatory compliance, etc.)

- What issues might introduce barriers to additional spending? (budget shortfalls, concern about new spending, competing priorities, etc.)
- How much lead time is needed to get projects inserted into local operating and capital budgets?
- How much time is needed to complete project designs? To complete construction?
- Who are the key staff that make budget decisions and when is the right time and the right way to approach them?
- Are there any existing budget accounts or line items where funds can be added to support watershed planning and implementation?

Real World Example: Worcester County Comprehensive Plan Update

In 2001, Worcester County on Maryland's Eastern Shore set out to update its comprehensive plan. During the course of the update, in 2004, the County worked with MD DNR under its Watershed Restoration Action Strategy program to craft a watershed plan for the Isle of Wight Bay watershed. This plan offered many recommendations for both programmatic/regulatory changes and for conservation and restoration projects. The county incorporated some of these recommendations along with additional recommendations made during a review of its development codes into its updated comprehensive plan.

One example of the goals and objectives set forth in the updated comprehensive plan recommended in the watershed plan calls for implementation of wetland, waterway and other restoration projects consistent with the watershed plans crafted for Isle of Wight and two other Coastal Bays' watersheds that are in progress. It also recommends continuing the watershed planning and restoration process throughout the remainder of the Coastal Bays' watersheds. A third recommendation is to develop a strategy to implement TMDL standards. A final recommendation includes outreach to landowners and citizens to educate them on how they can protect sensitive habitats on their property.
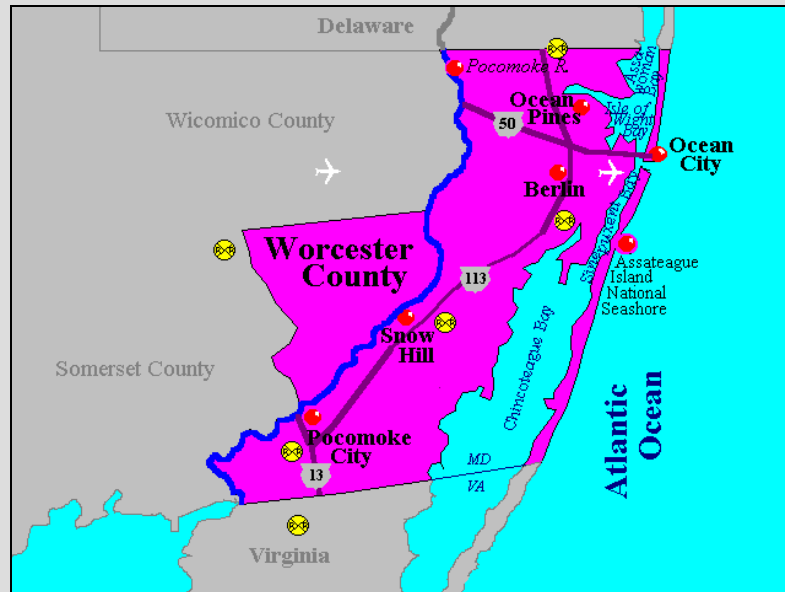

Photo from www.worcestercountyonline.org © 2004 Worcester County Economic Development Worcester County Department of Comprehensive Planning. 2005.

It is a good idea to try to shift funding toward capital budgets or some other dedicated funding source, which can provide funding over multiple years, and decrease reliance on operating budgets and grants (which seldom can be obligated for more than a year, and can disappear quickly during a budget crunch).

A survey by MD DNR (2004) has assembled data on how many watershed plans have been created and successfully navigated through local political systems across the state. According to the survey of communities that have completed plans for 47 MD watersheds, more than 90% of the plans have been formally adopted or endorsed, or have received funding, and in more than 80% of these watersheds, successful implementation has occurred. The second highest ranked funding source was capital program budgets.

Implementation planning table and project tracking

Data from the implementation planning table should be incorporated into a system that can be used to track projects as they are implemented. The system should store essential data on the design, construction, maintenance and performance of individual protection and restoration projects contained in the watershed plan including costs, responsible parties and complete schedule. For certain water bodies, tracking implementation is required to document the ways in which various projects represent TMDL implementation. The tracking system typically uses a common spreadsheet or GIS to keep the team apprised on project status and stream response and to help improve the delivery of future protection and restoration projects. The core team is responsible for ensuring the implementation of the watershed plan. The core team should consider establishing a citizen committee at the end of the planning process to track implementation over time. This may also have the secondary benefit of sparking the creation of a watershed organization in some areas.

Three tasks are used to create a watershed project tracking system:

1. Determine key project management information to track
2. Continuously update project information in a tracking system
3. Periodically report on status of project implementation

Initial project information can be extracted from the project tracking file prepared during final design and construction. Subsequent project information is entered as the project is inspected, maintained and monitored, using standard forms. No major mapping needs are required for the tracking database, although the geospatial coordinates of projects should be provided so that their locations can be mapped in the watershed.

Progress in project implementation should be compiled in a short annual report or memo distributed to key stakeholders, if budget resources allow. The report should summarize the number, type, and extent of protection or restoration practices implemented in the watershed, with an emphasis on both project successes and failures.

Project tracking also helps ensure that all restoration or protection projects are reported as contributions to TMDL implementation requirements to reduce or offset nonpoint source (NPS) pollution. Sometimes these projects are known by another name such as a stormwater management retrofit or forest conservation, but many of these projects count towards TMDL

implementation requirements. These projects also need to be incorporated into the Chesapeake Bay watershed model, and local governments should plan on reporting their activities to the Chesapeake Bay Program in units that the model uses to track NPS pollution reduction. Local governments should also consider reporting project implementation to MD DNR for entry into their BMP Tracking Implementation database that can be found at: http://dnrweb.dnr.state.md.us/watersheds/surf/bmp/.

F. A Concluding Note on Implementation

Implementation is by far the longest step associated with a watershed plan. The purpose of this final step is to sustain momentum and adapt the plan as more experience is gained in project implementation. Much of the watershed planning field is so new that each plan is basically its own watershed experiment. As a result, it is important to institute tracking and monitoring systems. These systems include the internal tracking of the delivery of restoration projects, monitoring of stream indicators at sentinel monitoring stations or performance monitoring of individual restoration projects. Information gathered from tracking systems are then used to revise or improve the plan over a five to seven-year cycle.

The management endpoint is fairly simple – a measurable improvement in the indicators used to define subwatershed quality. Full implementation of the plan may take five years or longer. The core team faces many challenges during this period in how to:

- Sustain progress in delivering restoration projects over time
- Create or sustain a watershed group or similar structure to advocate for the plan
- Monitor trends in stream indicators
- Monitor the performance of practices installed
- Adapt the plan to if the expected improvements do not occur